SUBJECT INDEX

Anaerobic bacteria
  aggregation in anaerobic systems 9–11
  and anaerobic digestion 1–6
  metabolism 1, 2
  methods of assessment
    F420 (coenzyme) technique 8
    methanogenic activity 9
    quantitation of lipids 9
    viable counting 7, 8
  study 1
Anaerobic baffled reactor 42
Anaerobic digestion
  adaptability 87
  advantages 124
  cf. aerobic digestion 124
  bacteria involved 3–6, *see also named species*
  bacterial aggregation 9–11, *see also* Granulation
  beneficial effects 1
  biogas generation 143
  and biomass, methods of quantitation 7–9
  in Brazil 124–133, 135–141, *see also* Vinasse
  brewery and soft drinks wastewaters 129–133
  in developing countries 41, *see also named countries*
  high rate treatment process 43
  immobilization principles 42, 43
    complex waste waters 43
  and landfill waste 165
  loading potential 41, 43
  natural occurrence 1
  perspectives 11
  pilot studies 87
  principle 1
  process development 55
  requirement 123, 124
  schematic representation 42, *see also named reactors*
  stages 2
  systems 15, *see also named systems*
  technology, *see named reactors*
  and toxic wastewaters 27–39
    classification, toxic chemicals 38
    competitive and uncompetitive models 32, 34
    gas production 27, 28
    general considerations 27, 28
    kinetic models 32, 33
    molecular structure basis 32, 35, 37
    pH 30
    response recovery models 30
    sulphide 28
    toxic activity models 30
  vinasse 125–129, 137–141
Anaerobic expanded bed reactors 42
Anaerobic fermentation, *see* Anaerobic digestion
Anaerobic filter 71
Anaerobic filter system
  design 87, 88
  and food processing wastewater 88
    design 88, 89
    maintenance 96
    performance 88, 90, 91, 96
Anaerobic gaslift reactor 42
Anaerobic wastewater treatment, *see* Anaerobic digestion

Biogas, *see also* Methane
  clean-up 143–145
  compression 143–145
    generation 143
    methane content 143
    vehicular use 145–150
Brazil
  anaerobic digestion, requirement for 124
  ethanol production 124
  fermentation effluent 124–133, 135–141, *see also* Vinasse
  sanitation
  sewage treatment 109, 143
Brewery and soft drinks wastewaters
  production 129, 130
  treatment, USAB reactor
    cost 133
    efficacy 130–132
    operation 130

Carbon dioxide 1
  from municipal solid waste decomposition 151, 152, 155
  reduction 5
Cellulose 1

Domestic sewage, USAB reactor treatment 110–121
Downflow anaerobic filter 42
Downflow stationary fixed film 72

Fermentative bacteria 3
Floating bed system 42
Fluidized bed reactors 42

Gas–solids separator, in USAB reactor 100
Granular methanogenic sludge, *see* Granular sludge
Granular sludge
  activity tests 19
  bacterial component 16–18
  bench scale system 22, 23
  chemical composition 18
  coenzyme F420 content 19
  growth, factors triggering 16
  mesophilic vs. thermophilic 24
  microbial adhesion in 23, 24
  SEM appearance 16, 17
  settling properties 18
  substrate flux 20–22
Granulation
  and bacterial adherence 44
  and upflow blanket reactor 42–51

Homoacetogenic bacteria 4
Hydraulic retention time 124, 171
Hydrogen producing acetogenic bacteria 3

Landfill
  and adverse environmental impact 177
  analysis 156
  codisposal of municipal solid waste and industrial waste sludge 177–192
    efficacy 181–192
    experimental model 179, 180
    leachate analysis 181–192
    leachate recycle 180, 181
    operation 180, 181
  gas production, factors affecting 151, 152, 155–160
  organic material decomposition, municipal solid waste 151
  management 177, 178
  upflow sludge bed-filter treatment, of leachate 83, 84

Methane 1, 143, *see also* Biogas
  economy 148, 149
  from municipal solid waste decomposition 151, 152, 155–160
  pollution 148
  properties 148
  safety 148
  vehicular use 145–150
Methogenic bacteria 4–6
Municipal solid waste
  anaerobic digestion 165–175
  composition 152–155, 164
  decomposition products 151, 164
  disposal, landfill 151, 163, 177
  gas production 151, 155–160, 164
  and industrial waste sludge 177–192
  organic material decomposition 151
  and primary sewage 165, 167–169

Pellet sludge 16, *see also* Granular sludge

São Paulo
  municipal solid waste 163
  sewage collection 109
  sewage treatment 109
Sugar cane
  effluent
    and fish culture 136, 140, 141
    treatment 135
  and fertirrigation 135
Sulphate reducing bacteria 6

Upflow anaerobic filter 42
Upflow anaerobic sludge blanket reactor
  bench scale systems 22, 23
  and biogas disposal 68
  in Brazil 88, 109, 124–133, 135–141, *see also* Vinasse
  cost 106, 107
  corrosion prevention 102
  demonstration scale, domestic sewage
    cost 120
  data evaluation 120
    design 119
    operation 120
    system 119
  design 56, 71, 72
    basic criteria 59, 60, 100
    capacity 46
    construction materials 60, 61
    cost 64
    effluent withdrawal system 63, 64
    gas collectors 61, 62
    gas deflectors 62
    internal settlers 61, 62
    mixing levels 62, 63
    modular 102
    optimal 99
    reactor volume 64

semi-pilot scale 110
shape 60, 61
and domestic sewage 110–121
and effluent post-treatment 67
and exces sludge disposal 67, 68
feed inlet system 101
first start-up, factors influencing 45
and food procesing wastewater 88
design 90, 92
future trends 96, 97
performance 92–96
gas–solid separator 110
granular sludge in, *see* Granular sludge
loading potential 47, 99
modified systems 104
and nutrients 58, 59
one-step and two-step process configuration 103, 104
operational conditions, evaluation, 65–67
organic loading, and flow variations 58
cf. other systems 15, 73–75
and partially soluble wastes 106
peak load accommodation 99
and pH 58, 59
semi-pilot scale, domestic sewage
design 110
operation, pre-settled sewage 111–113
operation, raw sewage 113–118
reactor dimensions 102, *see also* UASB, design
requirements of process 44
schematic representation 56
secondary start-up 45, 46
in São Paulo 109
and soluble wastes 104, 105
and suspended solids 56
and temperature 57, 58
and toxic compounds 57
treatability level 59
treatment results 47–51
cf. upflow sludge bed-filter 73–75
use 56
and vinasse biodigestion 125–129, 136
cost 127–129
efficacy 126, 127
operation 125, 128
treatment system design 125, 136, 137
and well settling sludges 15
Upflow sludge bed-filter treatment system
critical upflow velocity 80, 81
and domestic strength synthetic wastewater 79, 80
and filter depth 82, 83
and landfill leachate 83
mixing 75
overloading 81, 82
cf. upflow anaerobic sludge blanket reactor 73–75
Upflow sludge blanket reactor, *see* Upflow anaerobic sludge blanket (UASB) reactor

Vinasse
anaerobic digestion 125–129
biodigestion
system design 137
system efficacy 137–140
disposal 125
and ethanol distillation 125
factors influencing production 125
and fertirrigation 140
and fish culture 140, 141
treatment 125

Wastewaters, *see named types*